

Notes on Meteors observed at Penarth, Glamorgan, on 1896, Nov. 14. By George Carslake Thompson, LL.M., and H. W. Lloyd Tanner, M.A., F.R.A.S.

Our attention was mainly directed to the region of *Leo Major*. A building behind us cut off the western sky, some trees cut off the south, and we faced east or north-east. We both watched for about four hours after midnight with an interval specified in the following table. After 4 A.M. the observations were continued till 5.20 A.M. by Mr. Carslake Thompson alone. Each observation was recorded and rough notes were written at the time by G. C. T.

The entries in column A1 refer to meteors from the Sickie in *Leo*; A2, from the region above the Sickie; A3 from the region of β *Leonis* or the region between β and the Sickie. The entries in column B are of meteors from other directions. The directions of the meteors noted in column C were not determined.

Time.	A			B	C	Notes.
	1	2	3			
Soon after midnight	...	...	...	I	...	
12 35	I	...	...	...	...
12 45	...	...	I	...	...
12 52	I	...	...	...	...
12 57	I	...	...	...	...	Short course with fine train; appeared 3 or 4 degrees eastward of Sickie; direction of course, perpendicular to and bisecting the line joining γ and ζ <i>Leonis</i> .
1 11	...	I	...	...	...
1 30	I	...	...	...	...	Very faint and very short course; appeared very near ζ <i>Leonis</i> ; course inclined upwards at perhaps 30° to line joining γ and ζ .
1 34	I	...	...	...	...
1 37	...	...	...	...	I	
1 47	...	...	I	...	...
1 54	I	...	...	...	...	Fine train from direction ζ <i>Leonis</i> Maj. towards η or ζ <i>Ursæ</i> Maj.
1 54½	I	...	...	I	...	In same line; might have been same one coming into the air again.
1 58	...	...	...	...	...
2 1	I	...	...	...	...	A very fine one; passed very close to ψ and γ <i>Ursæ</i> Maj. (perhaps half a degree above them) in a line parallel to the line joining these stars. Train persisted 2 or 3 seconds.

Time.	A			B	C	Notes.
	1	2	3			
2 6-7	...	I	...	...	...
2 6-7	...	...	...	...	I	
2 6-7	...	...	...	...	I	
2 14	I	...	...	...	...
2 20	...	I	...	...	...	A rather faint one; downwards, past, and to ζ and γ Leonis Maj. (counted as from general direction of Leo, but query; compare two at 4:25 not so counted).
2 26	...	...	...	I	...	
2 27	I	...	...	...	...
2 29	I	...	...	...	...
2 30	I	...	...	...	...
2 30 ¹ ₂	I	...	...	...	...
2 36	I	...	...	...	...	Persistent train.
2 36-7	...	...	...	...	I	
2 36-7	...	...	...	...	I	
2 41	...	...	...	I	...	
2 45	...	I	...	...	...
2 53	I	...	...	...	...
2 58	...	I	...	...	...
3 0	I	...	...	...	...
3 1	...	...	I	...	...
3 4	...	I	...	...	...
3 5	I	...	...	...	...
3 5 ¹ ₂	I	...	...	...	...
3 6	...	...	...	I	...	
3 6	I	...	...	...	...
3 7	...	...	...	I	...	
3 7	...	...	...	...	...
3 9	...	...	...	I	...	
3 14	...	...	...	I	...	
3 15	...	...	...	I	...	
3 20	...	...	...	I	...	
3 20	...	...	...	I	...	
Interval						
3 20-3 42						
3 43	I	...	...	...	...
3 45	I	...	...	...	...
3 47	...	...	...	...	I	
3 50	...	...	...	I	...	

Time.	A			B	C	Notes.
	1	2	3			
3 50	...	I	...	...	...
3 51	...	...	...	I	...	
3 55	I	...	...	...	...
3 55½	I	...	...	...	...
3 56	...	...	...	I	...	
3 58	I	...	...	...	...
4 0	...	...	I	...	...
4 0½	...	...	...	I	...	
4 2	I	...	...	...	...
4 6	I	...	...	...	...
4 10	...	...	...	I	...	
4 15	...	...	...	...	I	
4 15	...	...	...	I	...	Long course from west to east, nearly parallel to horizon, across Hydra. (?) Sluggish motion and faint train; manifestly not a Leonid.
4 22	I	...	...	...	...
4 23	I	...	...	...	...
4 25	...	...	...	2	...	Two faint meteors simultaneously giving downward near δ Leonis Maj.
4 30	...	...	I	...	...
4 36	I	...	...	...	...
4 48	I	...	...	...	...
4 52	...	...	...	I	...	
4 59	...	...	I	...	...
5 1	I	...	...	...	...
5 4	...	I	...	...	...
5 9	I	...	...	...	...

Ceased observations at 5 20.

A large proportion of the meteors, including most of those that did not come from *Leo*, were faint. About ten seem to have been noted as having brilliant trains; all of these were from the direction of the Sickle. The flight of the meteors in all these cases was very swift. The trains appeared to G. C. T. generally to have a slight greenish tinge, and to give the impression of being broadest in the middle of the course, tapering towards each end.

Up to about 2 A.M. there was a strong moonlight with some amount of light cloud (not persistent), and perhaps some auroral light. After about 2 A.M. the sky was beautifully clear, without moonlight.

Real Paths of 107 Meteors observed during the Ten Years ending 1896 November. By W. F. Denning.

The following are the heights, radiants, &c. of such fireballs and shooting stars as have been observed at two or more stations in England during recent years, and submitted to comparison and calculation by the writer. Some of the results have been published before in a detached form in the Journals of the Liverpool Astronomical Society and British Astronomical Association, and in *The Observatory* or *Nature*. They are now brought together in a complete form, and arranged according to the day of the year. It is thought this plan will facilitate reference and prevent troublesome searches amongst various publications on the part of those making inquiries into the subject. Many of the observations were made in connection with the meteoric sections of the two societies above named. The principal observers were Mr. H. Corder, Bridgwater ; Mr. D. Booth, Leeds ; Professor A. S. Herschel, Slough ; and the writer, Bristol. Several other observers contributed useful observations, and the abbreviations are :—

T. W. B. . . .	T. W. Backhouse, Sunderland.
E. R. B. . . .	E. R. Blakeley, Dewsbury.
D. B.	D. Booth, Leeds.
H. C.	H. Corder, Bridgwater.
G. T. D. . . .	G. T. Davis, Reading.
W. F. D. . . .	W. F. Denning, Bristol.
J. E.	J. Evershed, Kenley, Surrey.
A. S. H. . . .	A. S. Herschel, Slough.
S. A. S. . . .	S. A. Saunder, Wokingham, Berks.

In the column headed "Velocity" "v." means very, "sw." swift, "m." moderate or medium speed.

The greatest height of any well-observed meteor in the list was that of a small Perseid (No. 65) seen before sunrise on 1893 August 15, which at its first appearance was 126 miles above the Earth's surface.

The height of ordinary meteors is seldom above 100 miles. There are, however, some notable exceptions. A meteor of the first magnitude was seen at the same time on 1890 December 9 by Mr. Booth at Leeds and by myself at Bristol, and the observations, which appear quite consistent, indicate a height of 208 miles at first appearance and 165 at disappearance, but the figures are so exceptional when compared with others that I have, in order to be on the safe side, rejected the observation.